

Mr. C. E. Buzzell, Leaf River, Ill.: April 10th, one small group five days in, increasing on 11th, and disappeared on the 12th. 11th, small group, new, two days past meridian, in view on 12th; clouds, 13th, with clear disc on 14th. 28th, one small group observed through clouds. 29th, good definition, two small groups in north latitude two days west of meridian, with a trail of smaller spots connecting them; all were unchanged on the 30th, with clear disc on May 1st.

Mr. John W. James, Riley, Ill.: none seen until 29th, then a group of small spots, about one-half day past sun's meridian.

Mr. M. A. Veeder, Lyons, N. Y.: 1st and 2d, faculae appeared by rotation, spots forming in their vicinity on 10th, and fading out again by 14th, the faculae alone being seen on the eastern limb, 15th. Faint faculae near the eastern limb, 5th and 11th. On the 22d faculae appeared by rotation, and on the 28th spots had formed in their vicinity, continuing with many changes until the end of the month. Observations were poor or lacking on 4th, 8th, 9th, 13th, 23d, and 27th.

H. D. Govey, North Lewisburgh, Ohio: sun spots were observed on the 12th and 30th.

VERIFICATIONS.

FORECASTS FOR 24 HOURS IN ADVANCE.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

The forecasts for districts east of the Rocky Mountains for April, 1890, were made by 1st Lieutenant Richard E. Thompson, 6th Infantry, Signal Officer, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant J. E. Maxfield, Signal Corps.

Percentages of forecasts verified, April, 1890.

States.		States.	
Maine.....	74.8	Kentucky.....	82.1
New Hampshire.....	72.7	Ohio.....	74.9
Vermont.....	73.9	West Virginia.....	76.9
Massachusetts.....	76.4	Indiana.....	80.5
Rhode Island.....	75.5	Illinois.....	83.0
Connecticut.....	73.1	Lower Michigan.....	80.0
Eastern New York.....	81.1	Upper Michigan.....	78.6
Western New York.....	78.9	Wisconsin.....	78.5
Eastern Pennsylvania.....	78.0	Minnesota.....	80.1
Western Pennsylvania.....	77.5	Iowa.....	80.7
New Jersey.....	76.7	Kansas.....	71.2
Delaware.....	76.5	Nebraska.....	76.6
Maryland.....	77.1	Missouri.....	70.9
District of Columbia.....	78.2	Colorado.....	81.2
Virginia.....	79.7	North Dakota.....	85.9
North Carolina.....	80.3	South Dakota.....	85.3
South Carolina.....	80.2	Southern California*.....	85.7
Georgia.....	77.7	Northern California*.....	87.1
Eastern Florida.....	85.0	Oregon*.....	81.7
Western Florida.....	93.9	Washington*.....	75.9
Alabama.....	82.9	By elements: Weather.....	83.5
Mississippi.....	79.9	Temperature.....	71.7
Louisiana.....	77.3	Monthly percentage of weather and	
Texas.....	78.0	temperature combined.....	78.8
Arkansas.....	78.0		
Tennessee.....	79.5		

*In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. †The forecasts of temperature in districts east of the Rocky Mountains for April, 1890, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

FORECASTS FOR 48 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for forty-eight and seventy-two hours, cov-

ering the second and third days in advance. Such forecasts are optional with the predicting officer, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 86; temperature, 42. Percentages of verifications: weather, 86.9; temperature, 77.4. Weather and temperature combined, 84.3.

No forecasts for seventy-two hours were made during the month.

CAUTIONARY SIGNALS FOR APRIL, 1890.

Statement showing percentages of justifications of wind signals for the month of April, 1890:

Wind signals.—(Ordered by Lieutenant Richard E. Thompson.) Total number of signals ordered, sixty-nine; justified as to velocity, wholly, forty-three, partly, two; justified as to direction, sixty-six. Of the signals ordered, fifty-five were cautionary signals, of which thirty-four were wholly, and one partly justified, and fourteen were storm signals, of which nine were wholly, and one partly justified. Thirty-four signals were ordered for easterly winds, of which thirty-three were justified, and thirty-five were ordered for westerly winds, of which thirty-three were justified. Percentage of justifications, 68.0.

Cold-wave signals.—(Ordered by Assistant Professor T. Russell.) Total number of signals ordered, thirty-three; justified, thirteen. Percentage of justifications, 39.4.

Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for April, 1890.

States.	Weather.	Temperature.	States.	Weather.	Temperature.
Illinois.....	82.0	76.6	Nebraska.....	84.9	87.2
Indiana.....	79.0	83.0	New Jersey.....	87.5	88.8
Kansas.....	82.6	84.2	New York.....	86.5	85.2
Kentucky.....	91.0	90.0	Ohio.....	82.0	88.0
Michigan.....	88.5	85.5	Pennsylvania.....	83.0	89.0
Minnesota.....	74.0	78.0	South Carolina.....	84.9	90.6
Missouri.....	76.0				

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for April, 1890, of the directors of the various state weather services:

ALABAMA.

Temperature.—Highest monthly mean, 68.8, at Citronelle; lowest monthly mean, 61.5, at Valley Head; maximum, 89, at Wiggins, 15th; minimum, 31, at Elkmont, 4th and 11th; greatest local monthly range, 53, at Guntersville and Wiggins; least local monthly range, 29, at Union Springs.

Precipitation.—Greatest monthly, 5.94, at Carrollton; least monthly, 1.20, at Mount Willing.

Wind.—Prevailing direction, southwest.—P. H. Mell, Signal Corps, Auburn, director.

ARKANSAS.

Temperature.—The average was about 2 below the normal; maximum, 93,

at Lead Hill; minimum, 33, at Ozone. A number of stations reported light frost on the 10th; no damage except to delicate plants.

Precipitation.—The average was 6.51 in excess of the normal of the past three years; greatest monthly, 12.95, at Hot Springs; least monthly, 5.71, at Lead Hill.—M. F. Locke, Commissioner of Agriculture, Little Rock, director; W. U. Simons, Sergeant, Signal Corps, assistant.

COLORADO.

Temperature.—The mean was about 0.5 below the normal; highest monthly mean, 53.9, at Fruita; lowest monthly mean, 25.9, at Climax; maximum, 88, at Lamar, 11th; minimum, —3, at Climax, 8th; greatest local monthly range, 69, at Thon; least local monthly range, 41, at Alma.